

2015 INDIANA FIREWORK- RELATED INJURY REPORT

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Indiana State
Department of Health



Division of Trauma and Injury Prevention

Indiana State Department of Health

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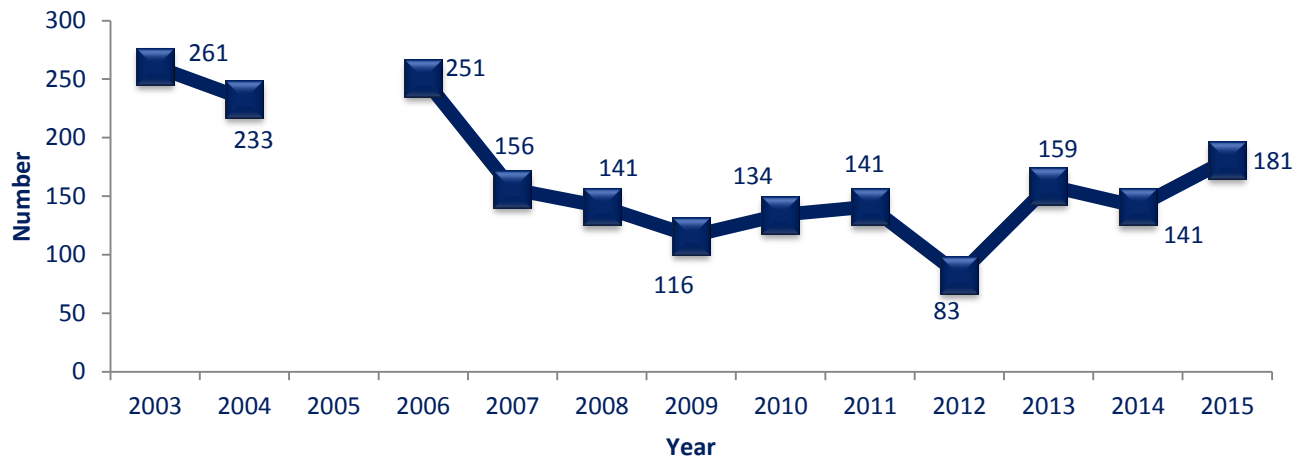
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Division of Trauma and Injury Prevention

2015 FIREWORK-RELATED INJURY REPORT

All hospitals, medical facilities and private medical practices are mandated by law to report all firework injuries and deaths to ISDH; however, it is estimated that the number of injury reports received is an underestimation of the true burden of fireworks injuries. This report presents firework-related injury data compiled from submitted fireworks forms for the 2015 reporting cycle (Sept. 13, 2014 – Sept. 12, 2015). Figure 1 indicates the number of firework-related injuries from 2003 to 2004 and 2006 to 2015.

Figure 1. Firework-related injuries by reporting cycle year, Indiana, 2003–2015*



*2015 reporting cycle included cases from Sept. 13, 2014–Sept. 12, 2015.

Source: Indiana State Department of Health, Division of Trauma and Injury Prevention.

2015 highlights

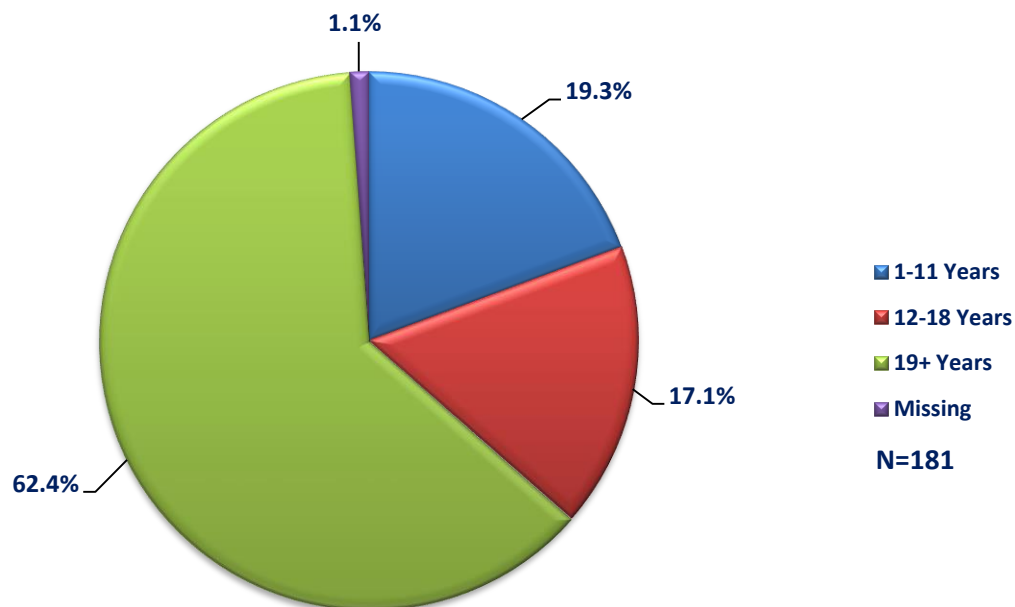
- ❑ There were 181 unduplicated cases of firework-related injuries reported to ISDH. One death was reported due to these injuries. Another death was reported in the media but was not captured in the ISDH firework-related injury reporting system. The information ISDH had was incomplete because it was not reported through the regular channels.
- ❑ More than one-third of all reported firework-related injuries involved individuals 18 years of age and younger. The youngest injured person was 1 year old.
- ❑ Eighty-five cases occurred on July 4, 2015, which represents 47 percent of all reported cases.
- ❑ Forty-three percent of firework-related burn injuries were to the hands and/or fingers.
- ❑ Thirty-three cases were hospitalized or transferred to another hospital for treatment.
- ❑ Eye injuries accounted for 16.3 percent of the total number of injuries; nearly 90 percent of these cases did not use eye protection.
- ❑ Forty-seven percent of the injuries were caused by firecrackers, rockets and aerial devices.
- ❑ Malfunctioning or mishandling of fireworks accounted for nearly 58 percent of reported fireworks injury mechanisms.
- ❑ Firework use on private property accounted for 68.5 percent of reported injury cases.

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Demographics

- ❑ The median age of persons with a firework-related injury was 24 years. The average age of all injured persons was 24.5 years old; ages ranged from 1 to 78. Two cases did not report age.
- ❑ Nearly 36.5 percent of those injured were age 18 or younger, with 19.3 percent of those injured under the age of 12 (Figure 2).
- ❑ Across all age groups, males reported more firework-related injuries than females. Of reported injuries, 68 percent involved males. Two cases did not report gender. (Figure 3).
- ❑ Seventy-five percent of persons injured were white, 14.9 percent were black or African-American and 0.6 percent were multiracial (Figure 4). Race was not known or not reported in 9.9 percent of the injury reports. White males represented 50.2 percent of cases.
- ❑ One-third of the injury reports did not record ethnicity. Of those who reported ethnicity, Hispanic ethnicity was reported in 6.6 percent of cases.
- ❑ Eighty-nine percent of injured people provided a home address in Indiana, 4.4 percent reported out-of-state addresses, and 6.1 percent did not provide an address. Marion, Lake and St. Joseph counties reported the most cases of firework-related injuries, with 29, 10 and eight cases, respectively.

Figure 2. Firework-related injuries by age group, Indiana, 2015*

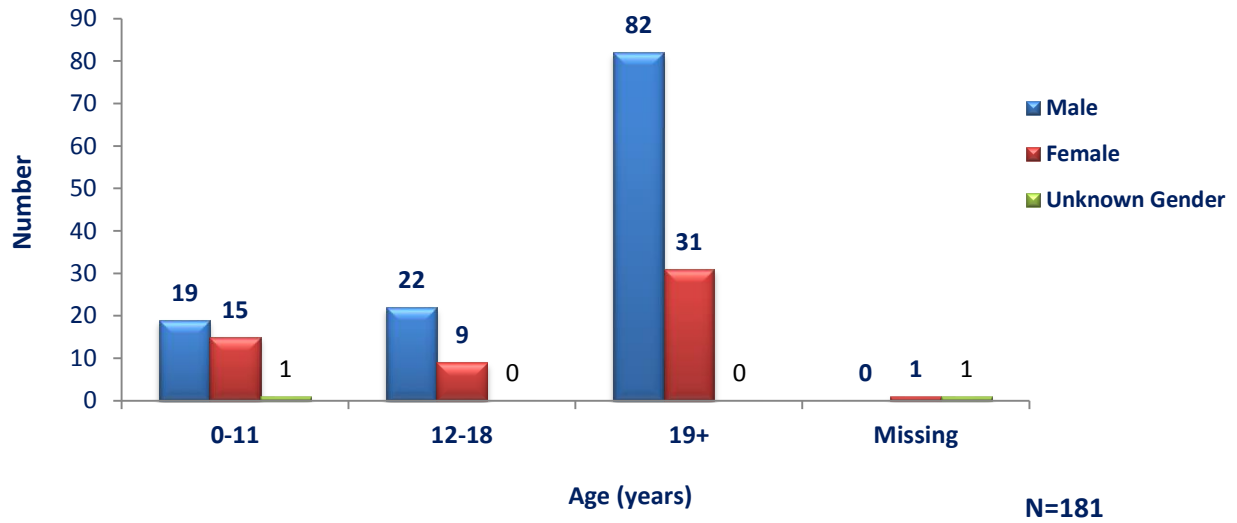


**2015 reporting cycle includes cases from Sept. 13, 2014-Sept. 12, 2015.*

Source: Indiana State Department of Health, Division of Trauma and Injury Prevention

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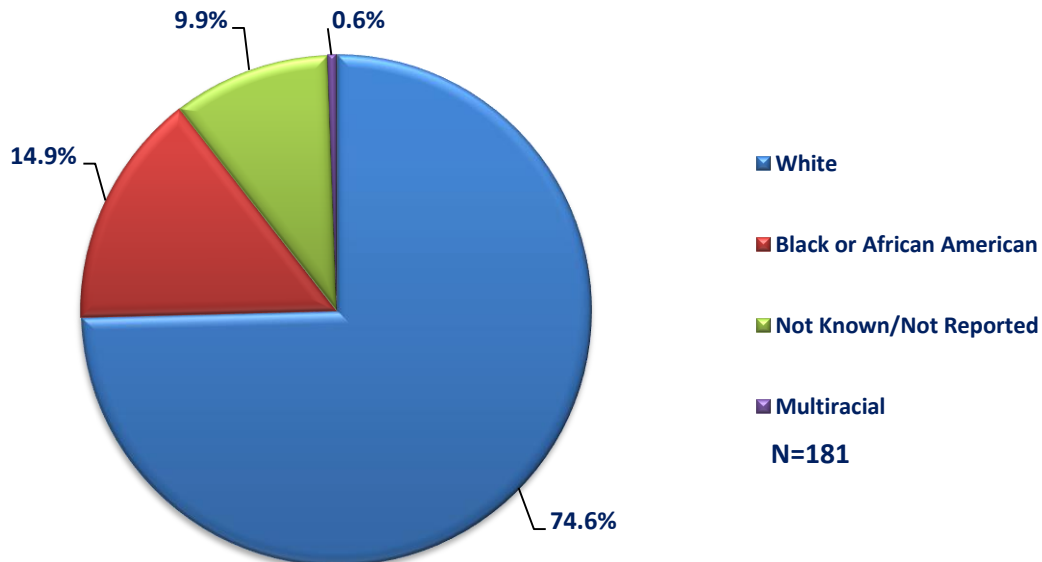
Figure 3. Firework-related injuries by age and sex, Indiana, 2015*



*2015 reporting cycle includes cases from Sept. 13, 2014-Sept. 12, 2015.

Source: Indiana State Department of Health, Division of Trauma and Injury Prevention

Figure 4. Firework-related injuries by race, Indiana, 2015*



*2015 reporting cycle includes cases from Sept. 13, 2014-Sept. 12, 2015.

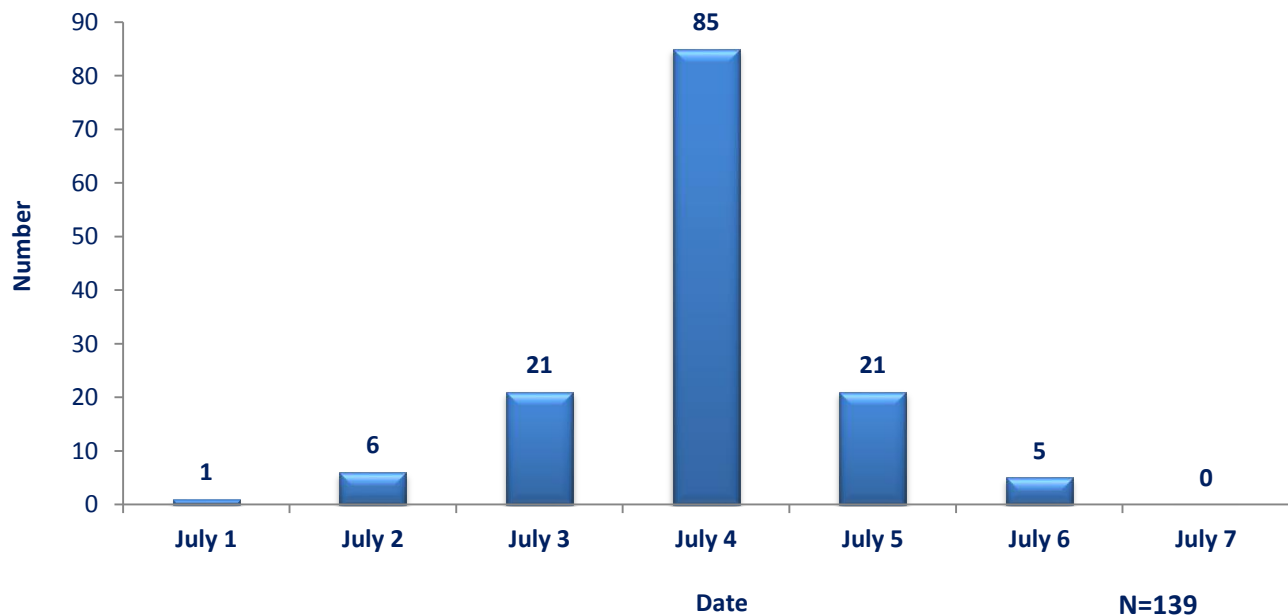
Source: Indiana State Department of Health, Division of Trauma and Injury Prevention

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Date and time of injuries

- Seventy-seven percent of all reported injuries in 2014 occurred from July 1–7, and 47 percent of all fireworks injuries in 2015 occurred on July 4, 2015 (Figure 5).
- One firework-related injury was reported between Sept. 12 and Dec. 31, 2014. Nineteen firework-related injuries were reported between Jan. 1 and June 30, 2015. Fourteen cases occurred from July 8 to Sept. 12, 2015. Eight cases did not have information about the date the injury occurred.
- Sixty percent of reported firework-related injuries occurred between 8 p.m. and midnight, with 34 cases occurring between 11 and 11:59 p.m. (Figure 6).
- Forty-one cases failed to report the time the injury occurred, of which 21 failed to report if the injury occurred before or after noon.

Figure 5. Firework-related injuries by date, July 1–July 7, Indiana, 2015*

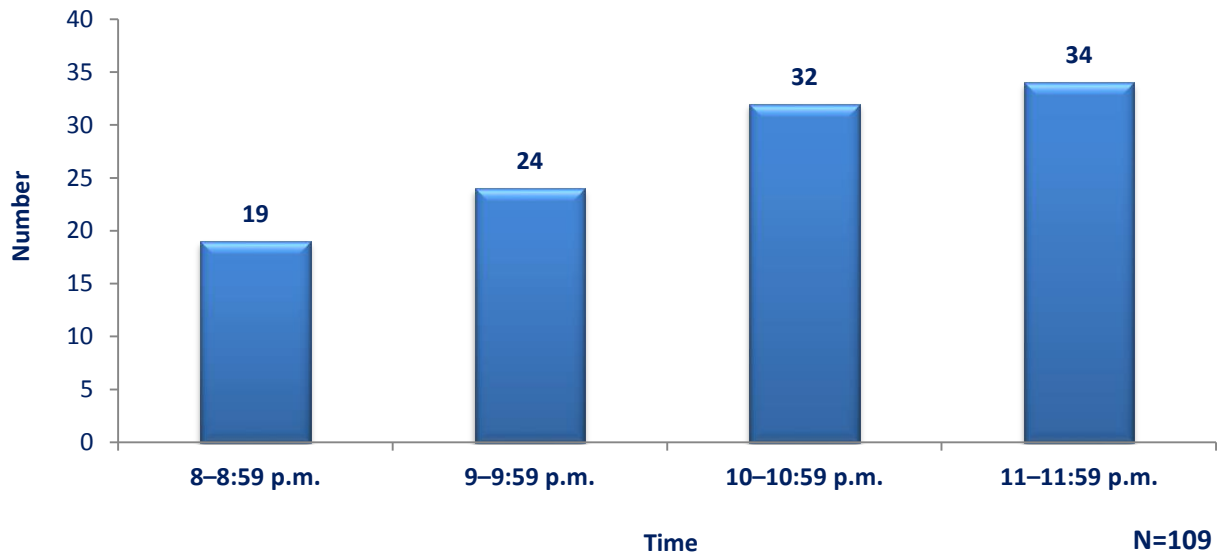


*2015 reporting cycle includes cases from Sept. 13, 2014–Sept. 12, 2015.

Source: Indiana State Department of Health, Division of Trauma and Injury Prevention

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Figure 6. Most frequent times of day when firework-related injuries occurred, Indiana, 2015*



*2015 reporting cycle includes cases from Sept. 13, 2014-Sept. 12, 2015.

Source: Indiana State Department of Health, Division of Trauma and Injury Prevention

Type of fireworks involved in injuries

- ❑ One individual was noted to be injured by more than one firework. The individual was reportedly injured from holding numerous sparklers that were lit at once and burned quickly.
- ❑ Rockets, firecrackers and aerial devices accounted for nearly half (47.5 percent) of the reported injuries (Table 1).
- ❑ At least nine of the “other” types of fireworks injuries were indicated to have involved mortars (tube-shaped devices used as launching mechanisms for shells in aerial fireworks displays).
- ❑ Malfunctioning or mishandling of fireworks accounted for nearly 58 percent of reported fireworks injury mechanisms (Figure 7). For 12 reports, there was more than one cause of firework-related injury, leading to 196 causes for 181 reported injuries.

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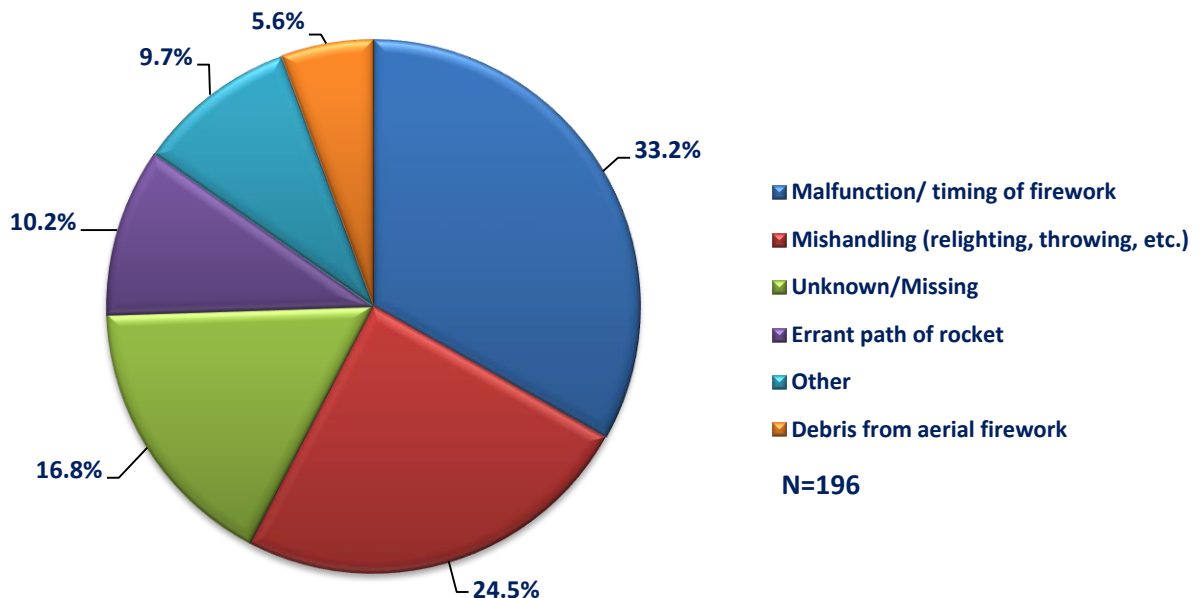
Table 1: Frequency and percent of firework type involved in injury, Indiana, 2015*

Firework Type	Frequency	Percent
Firecrackers	36	19.9%
Other, specified	35	19.3%
Sparklers	31	17.1%
Rockets	29	16.0%
Unknown	23	12.7%
Aerial devices	21	11.6%
Homemade fireworks	3	1.7%
Lighting gunpowder	2	1.1%
Twisters	1	0.6%
Pyrotechnics	0	0.0%
Total	181	100.0%

*2015 reporting cycle includes cases from Sept. 13, 2014-Sept. 12, 2015.

Source: Indiana State Department of Health, Division of Trauma and Injury Prevention

Figure 7. Cause of firework-related injury, Indiana, 2015*



*2015 reporting cycle includes cases from Sept. 13, 2014-Sept. 12, 2015.

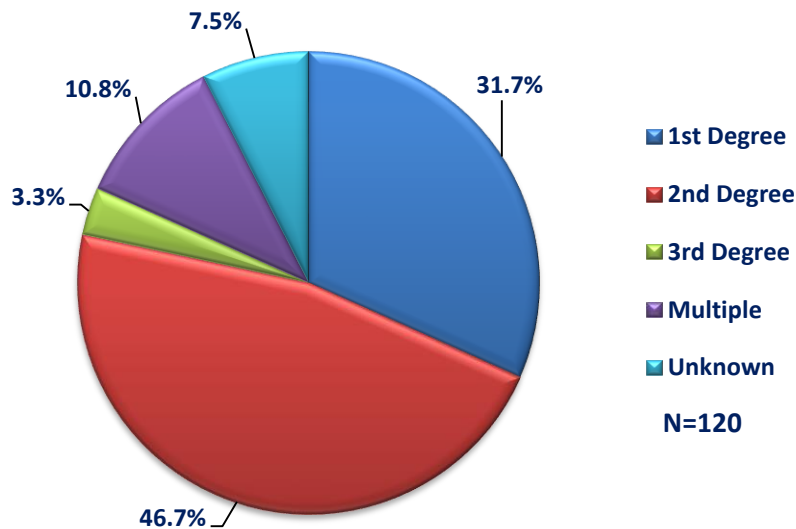
Source: Indiana State Department of Health, Division of Trauma and Injury Prevention

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Type of injuries

- During the 2015 reporting cycle, there were 228 firework-related injuries that occurred among 181 individuals. Thirty-three individuals experienced multiple types of injuries.
- Burn injuries were reported in 120 individuals of varying degrees of severity and affected 163 body parts:
 - 38 were first-degree burns
 - 56 were second-degree burns
 - 4 were third-degree burns
 - 13 were multiple-degree burns
 - 9 did not indicate degree of burn (Figure 8)
- Burns were the most commonly reported injury; 43 percent of burns were of the hands and/or fingers and 12.3 percent of burns were of the face, ear and head.
- Other types of injuries included contusions/lacerations/abrasions (21.8 percent), puncture wounds (5.2 percent), penetrating foreign body/missiles (4.4 percent), sprains/fractures (1.7 percent), other injuries (10 percent), and the injury was not known or not recorded in 3.9 percent of cases (Figure 9).
- Four injuries were documented to have resulted in amputation.

Figure 8. Degree of burn experienced from firework-related injury, Indiana, 2015*

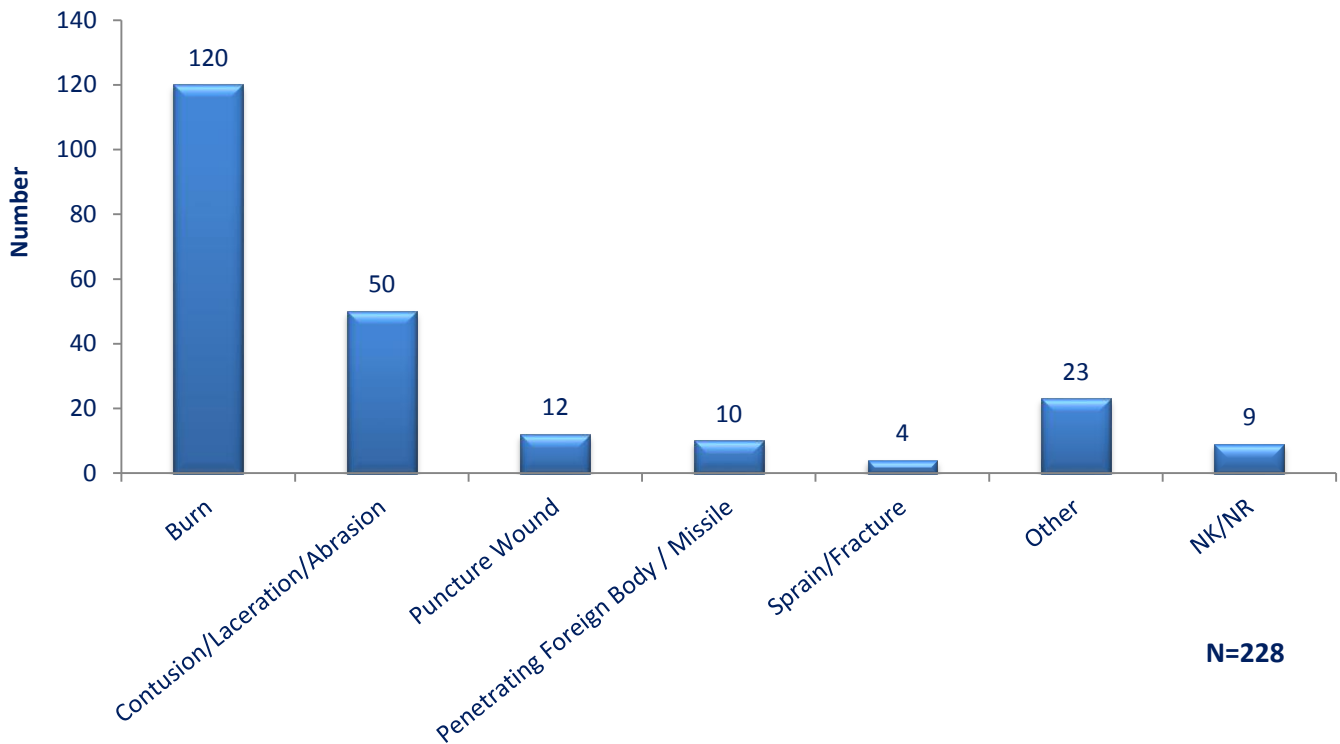


*2015 reporting cycle includes cases from Sept. 13, 2014-Sept. 12, 2015.

Source: Indiana State Department of Health, Division of Trauma and Injury Prevention

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Figure 9. Type of firework-related injury, Indiana, 2015*



*2015 reporting cycle includes cases from Sept. 13, 2014-Sept. 12, 2015.

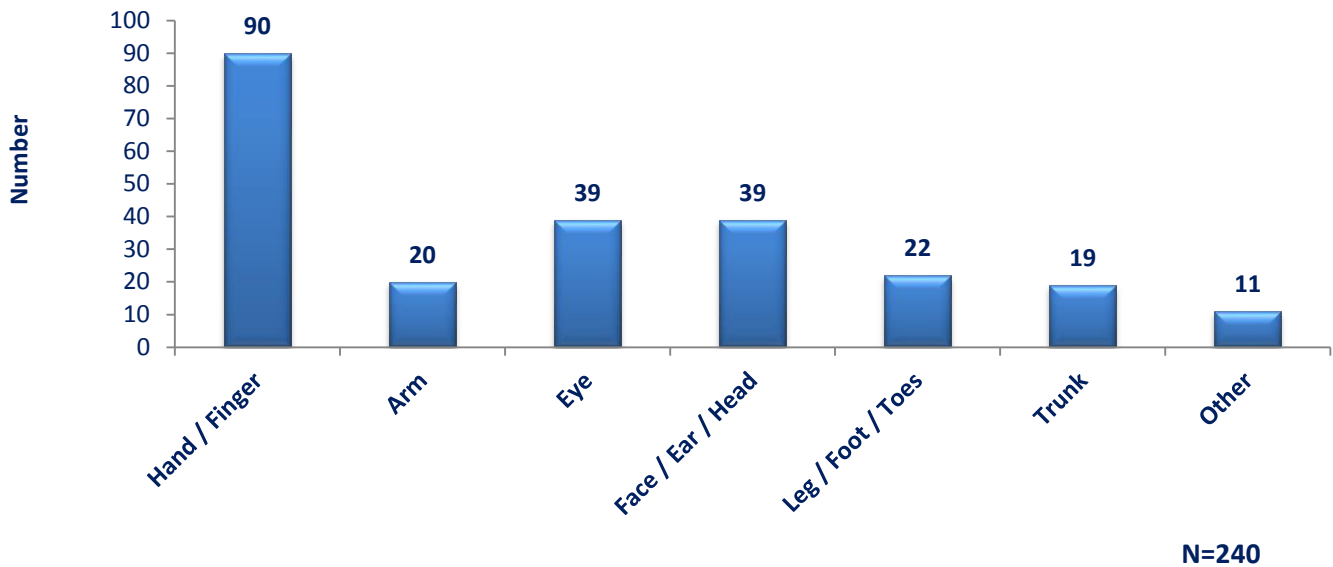
Source: Indiana State Department of Health, Division of Trauma and Injury Prevention

Body part injured

- In 2015, of the 181 total cases, 41 individuals experienced injuries to multiple body parts.
- The most common type of injury was to the hand or finger (Figure 10).
 - 45.8 percent of injuries involved the hand, finger or arm.
 - 16.3 percent of injuries involved the face, ear or head.
 - 16.3 percent of injuries involved the eyes.
 - 9.2 percent of injuries involved the leg, foot or toes.
 - 7.9 percent of injuries involved the trunk.
 - 4.6 percent of injuries involved other body parts, including the neck, back and buttock.
- Of the 39 individuals who had eye injuries, 89.7 percent (35 cases) did not have or use eye protection and two wore contact lenses. Two cases with eye injury did not indicate whether eye protection was used.

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Figure 10. Body part affected by firework-related injury, Indiana, 2015*



*2015 reporting cycle includes cases from Sept. 13, 2014-Sept. 12, 2015.

Source: Indiana State Department of Health, Division of Trauma and Injury Prevention

Source of care and injury outcomes

- The majority of people injured by fireworks sought care at an emergency department or urgent care center (95.6 percent). The remaining cases received care from provider offices (i.e. optometrist).
- 70.7 percent of those seeking treatment were evaluated and released to go home. Twelve cases indicated the patient was admitted to the hospital. Nineteen records did not provide information regarding the patient's outcome.
- There were 21 transfers from one hospital to another, most often to a trauma center. Four patients were transferred to another hospital outside of Indiana. One patient was indicated to have been transferred from another hospital to the reporting trauma center. Three individuals visited more than one facility to be evaluated and treated for firework-related injuries.
- One reported firework-related injury resulted in death. Media outlets reported an additional death, but this death was not captured through the ISDH reporting system. This additional death was excluded from this report because ISDH did not have enough information about the decedent and circumstances surrounding the injury and death.

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Additional information

□ Geographical location

- 68.5 percent of people were injured at a private home, yard or property.
- 13.8 percent were injured at someone else's home, yard or property.
- Public property was noted as the site for nearly 5 percent of injury occurrences.
- Four people were injured at other, unspecified locations, and one was injured on school property.
- Injury location information was unknown for 18 cases (9.9 percent) (Figure 11).

□ Alcohol use

- Alcohol use was recorded in 30 instances.
- Alcohol was consumed by 23 injured individuals, of which 15 cases reported consuming alcohol within three hours of injury, and 9 others were reported to be consuming alcohol at the scene. Three of those consuming alcohol and injured by fireworks were under age 21. (Figure 12).

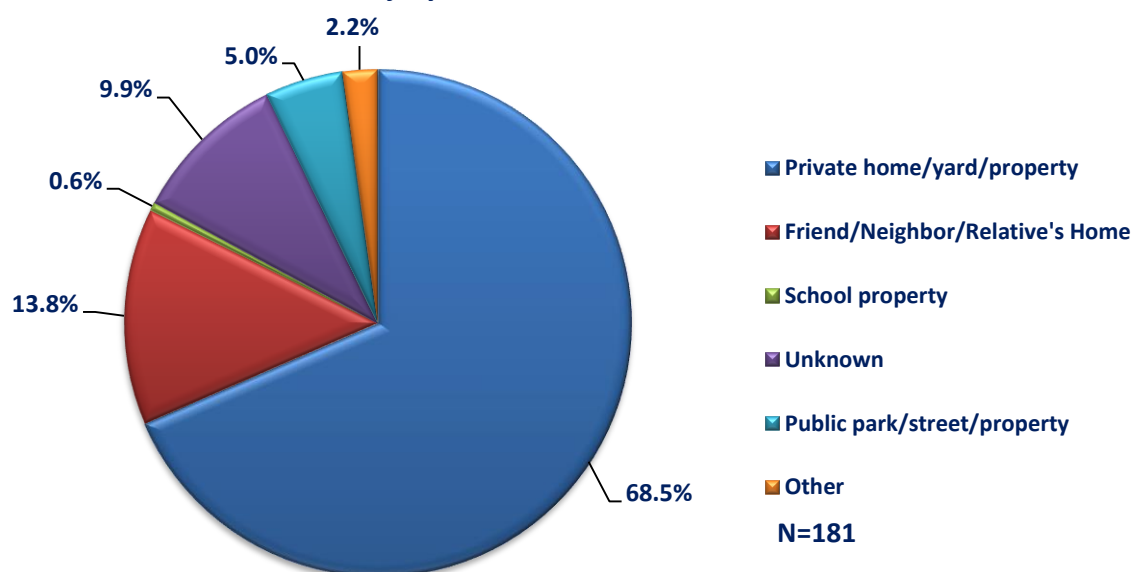
□ Adult supervision

- Among the 66 individuals injured who were 18 years old or younger at the time of the injury, 42 were injured while in the presence of an adult and eight had no adult supervision. Information regarding adult supervision was not reported in 16 cases (Figure 13).

□ Bystanders

- There were 21 firework-related injuries reported among bystanders, of which nine were 18 years old or younger.

Figure 11. Location of firework-related injury, Indiana, 2015*

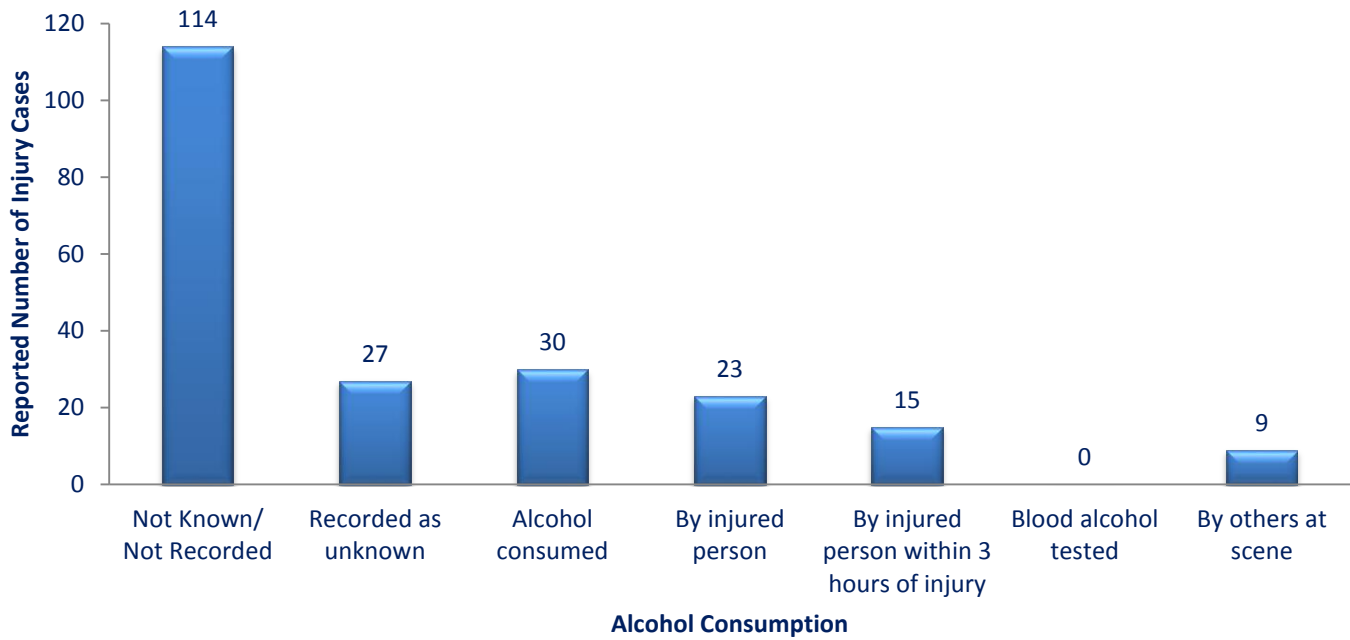


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Source: Indiana State Department of Health, Division of Trauma and Injury Prevention

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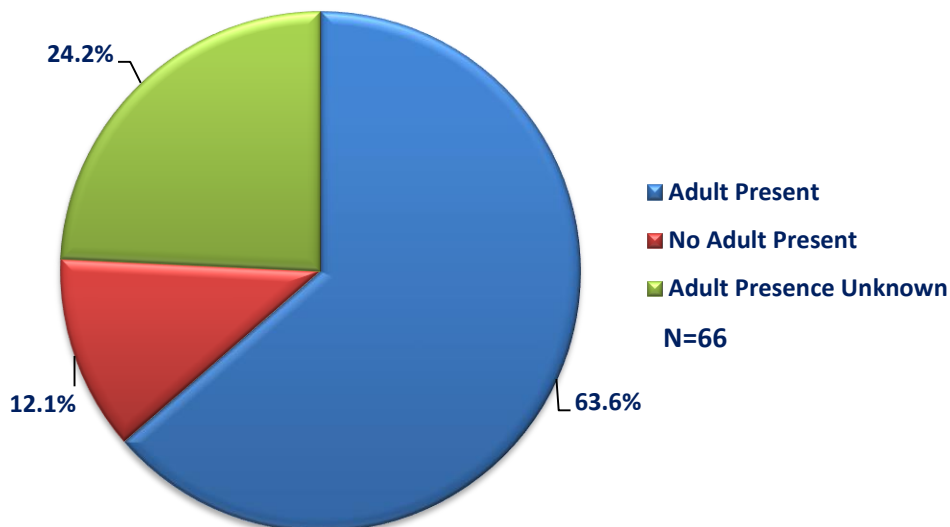
Figure 12. Alcohol use of those injured by fireworks, Indiana, 2015*



*2015 reporting cycle includes cases from Sept. 13, 2014-Sept. 12, 2015.

Source: Indiana State Department of Health, Division of Trauma and Injury Prevention

Figure 13: Adult supervision of individuals 18 years of age or younger, Indiana, 2015*



*2015 reporting cycle includes cases from Sept. 13, 2014-Sept. 12, 2015.

Source: Indiana State Department of Health, Division of Trauma and Injury Prevention

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Summary of firework-related injuries for 2015

There were 181 unduplicated cases of firework-related injuries reported to the ISDH during the 2015 reporting cycle. There were 40 more cases reported in 2015 compared to the previous year's report. While the ages of those injured ranged in age from 1 to 78, children and adolescents comprised nearly a third of reported firework-related injury cases. Males were injured more frequently than females across all age groups and 50.2 percent of all injured persons were white males. Nearly three-quarters (74.6 percent) of the individuals were white, 14.9 percent were black. Race was not known or not reported for 18 individuals. One hundred sixty-two cases were Indiana residents, with eight cases from other states and 11 with unknown or unrecorded home addresses.

More than half (62.1 percent) of the injuries involved the hands, fingers, eyes or arms. Burns were the most common type of injury, occurring in 120 injured persons and affecting 163 parts of the body. The majority (95.6 percent) of people injured by fireworks sought care at an emergency department or urgent care center, with the remaining cases seeking medical care from another type of provider. Of those seeking medical care, 70.7 percent were evaluated and released to go home and 18.2 percent were admitted to the hospital or transferred to another hospital.

For the 181 cases of firework-related injuries reported to ISDH during the entire reporting cycle, 76.8 percent occurred between July 1 and July 7 and 47 percent of injuries took place on July 4, 2015. Nearly sixty-nine percent of injuries occurred on private property. Firecracker, rocket and sparkler use resulted in 53 percent of firework-related injuries. The mechanism of injury was most commonly malfunctioning or timing of firework, followed by mishandling of fireworks.

This report has several implications. First, the knowledge of the most commonly affected body parts in firework-related injury can help focus prevention efforts to eliminate injuries. Second, identifying the day and time of most firework-related injuries can help medical personnel better prepare to treat these injuries. Thirdly, this report can help inform policy surrounding which firework types appear to be most dangerous.

There are several limitations of this report, which include the near certainty of underreporting and underrepresenting the true burden of firework-related injuries in Indiana because some medical facilities and providers may not report all of their firework injuries to ISDH. It may be because the physician or staff is not aware of the reporting requirement or because the patient does not acknowledge that he was injured by fireworks. Also, there may be some injuries due to fireworks that did not require formal medical evaluation or treatment. Additionally, not every report submitted to the state was completed fully or accurately. Some reports were sent numerous times, and this report only contains unduplicated records.

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APPENDIX

Firework-related injury year comparisons

The Indiana State Department of Health began receiving firework injury reports in 2003 after the collection of this information was mandated by law. After two years, the law expired and no reports were collected in 2005. In 2006, the law was reinstated with requirements identical to the previous law. Table 2 shows the comparison of firework-related injuries for the years in which reporting was mandated (2003, 2004, 2006-2015).

Table 2. Comparison of firework-related injuries, Indiana, 2003-2004 and 2006-2015

Year	2003	2004	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Number of cases reported	261	233	251	156	141	116	134	141	83	159	141	181
Demographics												
Median Age	18	18	17	20	21	19	20	21	23	23.5	25	24
Age Range (in years)	0-74	0-72	0-67	0-70	0-70	0-81	1-69	0-65	2-64	1-78	0-63	1-78
Children/Adolescents	53%	52%	55%	48%	50%	50%	47%	42%	36%	41%	32%	36%
Males	73%	76%	70%	67%	70%	72%	75%	72%	87%	70%	75%	68%
Females	27%	24%	30%	33%	30%	28%	25%	28%	13%	29%	23%	31%
White	84%	87%	82%	87%	73%	82%	73%	84%	77%	79%	76%	74%
Black or African American	10%	8%	13%	7%	14%	7%	16%	12%	16%	11%	12%	15%
Injury Type												
Burns	76%	67%	73%	69%	65%	61%	62%	55%	50%	56%	54%	53%
Body Part Injured												
Hand	34%	32%	36%	41%	33%	37%	27%	31%	42%	30%	33%	38%
Eye	17%	25%	29%	24%	21%	16%	17%	18%	13%	17%	16%	16%
No Eye Protection	82%	88%	97%	92%	76%	91%	91%	93%	93%	75%	77%	90%
Injury Circumstances												
Injured on Private Property	83%	89%	86%	83%	87%	84%	79%	67%	61%	60%	68%	69%
Children Injured with Adults Present	60%	50%	64%	61%	62%	41%	57%	87%	57%	64%	59%	64%
Hospitalized or Transferred to a Hospital	3%	6%	11%	8%	9%	10%	14%	12%	24%	11%	18%	18%
Died	0%	0%	0%	0%	1%	0%	0%	0%	1%	0%	0%	1%
Fireworks Circumstances												
Injuries from Sparklers, Rockets, and Firecrackers	63%	64%	57%	52%	53%	52%	51%	51%	47%	59%	54%	53%
Injuries from Mishandling Fireworks	27%	23%	29%	30%	28%	24%	23%	26%	24%	27%	29%	33%
Errant Path or Malfunctioning Fireworks	21%	37%	41%	35%	40%	41%	43%	43%	37%	44%	14%	43%

Source: Indiana State Department of Health, Division of Trauma and Injury Prevention